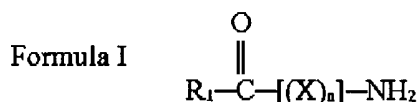


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This listing of claims will replace all prior versions, and listings, of claims in the application.

### Listing of Claims:

Claim 1. (currently amended) An antimicrobial peptide represented by Formula I:



wherein  $n=2$  and  $[(\text{X})_2]$  is Arg-Trp; and

~~X is any natural or non natural, modified or unmodified amino acid except glutamate or aspartate;~~

~~n 1 to 5;~~

~~wherein:~~

~~(a) when  $n=1$ , then~~

~~said peptide comprises a cationic amino acid;~~

~~the charge of said peptide at neutral pH is  $\pm 4$ ;~~

~~R<sub>1</sub> is C<sub>1</sub>-C<sub>20</sub>-alkyl; C<sub>2</sub>-C<sub>6</sub>-cycloalkyl; C<sub>4</sub>-C<sub>20</sub>-alkenyl; C<sub>4</sub>-C<sub>20</sub>-alkynyl; C<sub>1</sub>-C<sub>20</sub>-haloalkyl; C<sub>2</sub>-C<sub>20</sub>-haloalkenyl; C<sub>2</sub>-C<sub>20</sub>-haloalkynyl; C<sub>2</sub>-C<sub>20</sub>-alkoxyalkyl; C<sub>2</sub>-C<sub>20</sub>-alkylthioalkyl; C<sub>2</sub>-C<sub>20</sub>-alkylsulfinylalkyl; C<sub>2</sub>-C<sub>20</sub>-alkylsulfonylalkyl; C<sub>2</sub>-C<sub>20</sub>-cycloalkylalkyl; C<sub>4</sub>-C<sub>20</sub>-alkenylalkoxyalkyl; C<sub>4</sub>-C<sub>20</sub>-alkynylalkoxyalkyl; C<sub>4</sub>-C<sub>20</sub>-(cycloalkyl)-oxyalkyl; C<sub>4</sub>-C<sub>20</sub>-alkenylthioalkyl; C<sub>4</sub>-C<sub>20</sub>-alkynylthioalkyl; C<sub>4</sub>-C<sub>20</sub>-(cycloalkyl)-thioalkyl; C<sub>2</sub>-C<sub>20</sub>-haloalkoxyalkyl; C<sub>4</sub>-C<sub>20</sub>-haloalkenylalkoxyalkyl; C<sub>4</sub>-C<sub>20</sub>-haloalkynylalkoxyalkyl; C<sub>4</sub>-C<sub>20</sub>-alkoxyalkenyl; C<sub>4</sub>-C<sub>20</sub>-alkoxyalkynyl; C<sub>4</sub>-C<sub>20</sub>-alkylthioalkenyl; C<sub>4</sub>-C<sub>20</sub>-alkylthioalkynyl; C<sub>4</sub>-C<sub>20</sub>-trialkylsilylalkyl; C<sub>1</sub>-C<sub>20</sub>-alkyl substituted with NR<sub>3</sub>R<sub>4</sub>, nitro, cyano, or phenyl optionally substituted with R<sub>5</sub>, R<sub>6</sub>, and R<sub>7</sub>; C<sub>1</sub>-C<sub>20</sub>-alkoxy; C<sub>1</sub>-C<sub>20</sub>-haloalkoxy; C<sub>1</sub>-C<sub>20</sub>-alkylthio; C<sub>1</sub>-C<sub>20</sub>-haloalkylthio; NR<sub>3</sub>R<sub>4</sub>, or phenyl, benzyl, pyridyl, furanyl, thienyl, naphthyl, pyrimidinyl, benzofuranyl, benzothienyl, or quinolinyl each optionally substituted with R<sub>5</sub>, R<sub>6</sub> or R<sub>7</sub>;~~

~~R<sub>2</sub> is independently hydrogen; C<sub>1</sub>-C<sub>4</sub>-alkyl; or phenyl optionally substituted with at least~~

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one  $R_3$ ;

$R_4$  is independently hydrogen,  $C_1$ - $C_6$  alkyl, or phenyl optionally substituted with at least one  $R_3$ ;

$R_5$  is independently  $C_1$ - $C_6$  alkyl;  $C_1$ - $C_6$  alkoxy;  $C_1$ - $C_6$  haloalkyl; halogen;  $C_2$ - $C_6$  alkynyl;  $C_1$ - $C_6$  thioalkyl; phenyl or phenoxy each optionally substituted with at least one  $R_3$ ; cyano; nitro;  $C_1$ - $C_6$  haloalkoxy;  $C_1$ - $C_6$  haloalkylthio;  $C_2$ - $C_6$  alkenyl;  $C_2$ - $C_6$  haloalkenyl; acetyl;  $CO_2CH_3$ ; or  $N(C_2$ -alkyl) $_2$ ;

$R_6$  is independently methyl; ethyl; methoxy; methylthio; halogen; or trifluoromethyl;

$R_7$  is independently halogen; and

$R_8$  is independently halogen;  $C_1$ - $C_4$  alkyl;  $C_1$ - $C_4$  alkoxy;  $C_1$ - $C_4$  haloalkyl; nitro; or cyano;

(b) when  $n=2$  or 3, then

at least one of the amino acids is a cationic amino acid;

the net charge of said peptide at neutral pH is at least +1;

wherein  $R_1$  is selected from the group consisting of  $C_1$ - $C_9$  alkyl; and  $C_3$ - $C_6$  cycloalkyl; and  
;  $C_4$ - $C_6$  alkenyl;  $C_4$ - $C_6$  alkynyl;  $C_1$ - $C_6$  haloalkyl;  $C_3$ - $C_6$  haloalkenyl;  $C_3$ - $C_6$  haloalkynyl;  $C_2$ - $C_6$  alkoxyalkyl;  $C_2$ - $C_6$  alkylthioalkyl;  $C_2$ - $C_6$  alkylsulfinylalkyl;  $C_2$ - $C_6$  alkylsulfonylalkyl;  $C_3$ - $C_6$  cycloalkylalkyl;  $C_4$ - $C_6$  alkenyloxyalkyl;  $C_4$ - $C_6$  alkynyloxyalkyl;  $C_4$ - $C_6$  (cycloalkyl) oxyalkyl;  $C_4$ - $C_6$  alkenylthioalkyl;  $C_4$ - $C_6$  alkynylthioalkyl;  $C_4$ - $C_6$  (cycloalkyl) thioalkyl;  $C_3$ - $C_6$  haloalkoxyalkyl;  $C_4$ - $C_6$  haloalkenyloxyalkyl;  $C_4$ - $C_6$  haloalkynyloxyalkyl;  $C_4$ - $C_6$  alkoxyalkenyl;  $C_4$ - $C_6$  alkoxyalkynyl;  $C_4$ - $C_6$  alkylthioalkenyl;  $C_4$ - $C_6$  alkylthioalkynyl;  $C_4$ - $C_6$  trialkylsilylalkyl;  $C_1$ - $C_9$  alkyl substituted with  $NR_2R_4$ , nitro, cyano, or phenyl optionally substituted with  $R_5$ ,  $R_6$ , and  $R_7$ ;  $C_1$ - $C_6$  alkoxy;  $C_1$ - $C_6$  haloalkoxy;  $C_1$ - $C_6$  alkylthio;  $C_1$ - $C_6$  haloalkylthio;  $NR_2R_4$ ; or phenyl, benzyl, pyridyl, furanyl, thienyl, naphthyl, pyrimidinyl, benzofuranyl, benzothienyl, or quinolinyl each optionally substituted with  $R_3$ ,  $R_6$  or  $R_7$ ;

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~~R<sub>2</sub> is independently hydrogen; C<sub>1</sub>-C<sub>4</sub> alkyl; or phenyl optionally substituted with at least one R<sub>5</sub>;~~

~~R<sub>4</sub> is independently hydrogen; C<sub>1</sub>-C<sub>8</sub> alkyl; or phenyl optionally substituted with at least one R<sub>5</sub>~~

~~R<sub>3</sub> is independently C<sub>1</sub>-C<sub>6</sub> alkyl; C<sub>1</sub>-C<sub>6</sub> alkoxy; C<sub>1</sub>-C<sub>6</sub> haloalkyl; halogen; C<sub>2</sub>-C<sub>4</sub> alkynyl; C<sub>1</sub>-C<sub>6</sub> thioalkyl; phenyl or phenoxy each optionally substituted with at least one R<sub>5</sub>; cyano; nitro; C<sub>1</sub>-C<sub>6</sub> haloalkoxy; C<sub>1</sub>-C<sub>6</sub> haloalkylthio; C<sub>2</sub>-C<sub>4</sub> alkenyl; C<sub>2</sub>-C<sub>6</sub> haloalkenyl; acetyl; CO<sub>2</sub>CH<sub>3</sub>; or N(C<sub>1</sub>-C<sub>2</sub> alkyl)<sub>2</sub>;~~

~~R<sub>6</sub> is independently methyl; ethyl; methoxy; methylthio; halogen; or trifluoromethyl;~~

~~R<sub>7</sub> is independently halogen; and~~

~~R<sub>8</sub> is independently halogen; C<sub>1</sub>-C<sub>4</sub> alkyl; C<sub>1</sub>-C<sub>4</sub> alkoxy; C<sub>1</sub>-C<sub>4</sub> haloalkyl; nitro; or cyano;~~

~~(c) n=4 or 5, then~~

~~at least two of the amino acids are cationic amino acids;~~

~~the net charge of the peptide at neutral pH is at least +2;~~

~~R<sub>1</sub> is C<sub>1</sub>-C<sub>20</sub> alkyl; C<sub>4</sub>-C<sub>6</sub> cycloalkyl; C<sub>4</sub>-C<sub>20</sub> alkenyl; C<sub>4</sub>-C<sub>20</sub> alkynyl; C<sub>1</sub>-C<sub>20</sub> haloalkyl; C<sub>2</sub>-C<sub>20</sub> haloalkenyl; C<sub>2</sub>-C<sub>20</sub> haloalkynyl; C<sub>2</sub>-C<sub>20</sub> alkoxyalkyl; C<sub>2</sub>-C<sub>20</sub> alkylthioalkyl; C<sub>2</sub>-C<sub>20</sub> alkylsulfinylalkyl; C<sub>2</sub>-C<sub>20</sub> alkylsulfonylalkyl; C<sub>4</sub>-C<sub>20</sub> cycloalkylalkyl; C<sub>4</sub>-C<sub>20</sub> alkenyloxyalkyl; C<sub>4</sub>-C<sub>20</sub> alkyniloxyalkyl; C<sub>4</sub>-C<sub>20</sub> (cycloalkyl) oxyalkyl; C<sub>4</sub>-C<sub>20</sub> alkenylthioalkyl; C<sub>4</sub>-C<sub>20</sub> alkynylthioalkyl; C<sub>4</sub>-C<sub>20</sub> (cycloalkyl) thioalkyl; C<sub>2</sub>-C<sub>20</sub> haloalkoxyalkyl; C<sub>4</sub>-C<sub>20</sub> haloalkenyloxyalkyl; C<sub>4</sub>-C<sub>20</sub> haloalkyniloxyalkyl; C<sub>4</sub>-C<sub>20</sub> alkoxyalkenyl; C<sub>4</sub>-C<sub>20</sub> alkoxyalkynyl; C<sub>4</sub>-C<sub>20</sub> alkylthioalkenyl; C<sub>4</sub>-C<sub>20</sub> alkylthioalkynyl; C<sub>4</sub>-C<sub>20</sub> trialkylsilylalkyl; C<sub>1</sub>-C<sub>20</sub> alkyl substituted with NR<sub>3</sub>R<sub>4</sub>, nitro, cyano, or phenyl optionally substituted with R<sub>5</sub>, R<sub>6</sub>, and R<sub>7</sub>; C<sub>1</sub>-C<sub>20</sub> alkoxy; C<sub>1</sub>-C<sub>20</sub> haloalkoxy; C<sub>1</sub>-C<sub>20</sub> alkylthio; C<sub>1</sub>-C<sub>20</sub> haloalkylthio; NR<sub>3</sub>R<sub>4</sub>; or phenyl, benzyl, pyridyl, furanyl, thienyl, naphthyl, pyrimidinyl, benzofuranyl, benzothienyl, or quinoliny each optionally~~

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substituted with  $R_3$ ,  $R_4$  or  $R_5$ ;

$R_3$  is independently hydrogen;  $C_1$ - $C_4$  alkyl; or phenyl optionally substituted with at least one  $R_3$ ;

$R_4$  is independently hydrogen;  $C_1$ - $C_4$  alkyl; or phenyl optionally substituted with at least one  $R_3$ ;

$R_5$  is independently  $C_1$ - $C_4$  alkyl;  $C_1$ - $C_4$  alkoxy;  $C_1$ - $C_4$  haloalkyl; halogen;  $C_2$ - $C_4$  alkynyl;  $C_1$ - $C_4$  thioalkyl; phenyl or phenoxy each optionally substituted with at least one  $R_3$ ; cyano; nitro;  $C_1$ - $C_4$  haloalkoxy;  $C_1$ - $C_4$  haloalkylthio;  $C_2$ - $C_4$  alkenyl;  $C_2$ - $C_4$  haloalkenyl; acetyl;  $CO_2CH_3$ ; or  $N(C_1-C_2\text{ alkyl})_2$ ;

$R_6$  is independently methyl; ethyl; methoxy; methylthio; halogen; or trifluoromethyl;

$R_7$  is independently halogen; and

$R_8$  is independently halogen;  $C_1$ - $C_4$  alkyl;  $C_1$ - $C_4$  alkoxy;  $C_1$ - $C_4$  haloalkyl; nitro; or cyano.

wherein the antimicrobial peptide inhibits the growth of a microbe selected from the group consisting of bacteria, archaea, fungi, algae, protozoa, multicellular parasites and viruses.

Claim 2. (cancelled)

Claim 3. (cancelled)

Claim 4. (cancelled)

Claim 5. (cancelled)

Claim 6. (original) The antimicrobial peptide of claim 1 wherein said peptide is incorporated into a polymer.

Claim 7. (original) The antimicrobial peptide of claim 6 wherein said polymer is selected from the group consisting of a polysaccharide, a glycol polymer, a polyester, a polyurethane, a polyacrylate, a polyacrylonitrile, a polyamide, a polyolefin, a polystyrene, a vinyl polymer, a

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polypropylene, silk, a biopolymer, and mixtures thereof.

Claim 8. (cancelled)

Claim 9. (cancelled)

Claim 10. (cancelled)

Claim 11. (cancelled)

Claim 12. (cancelled)

Claim 13. (cancelled)

Claim 14. (cancelled)

Claim 15. (cancelled)

Claim 16. (cancelled)

Claim 17. (cancelled)

Claim 18. (cancelled)

Claim 19. (cancelled)

Claim 20. (cancelled)

Claim 21. (cancelled)

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Claim 22. (cancelled)

Claim 23. (cancelled)

Claim 24. (cancelled)

Claim 25. (cancelled)

Claim 26. (cancelled)

Claim 27. (cancelled)

Claim 28. (cancelled)

Claim 29. (cancelled)

Claim 30. (currently amended) A substrate coated with the antimicrobial of claim 146.

Claim 31. (cancelled)

Claim 32. (new) The substrate of Claim 30, wherein the substrate is selected from a group consisting of personal care products, health care products, household products, food preparation surfaces, food packaging surfaces, medical devices, wound dressings, surgical staples, membranes, shunts, surgical gloves, tissue patches, prosthetic devices, wound drainage tubes, blood collection and transfer devices, tracheotomy devices, intraocular lenses, laboratory devices, textile products and painted surfaces.

Claim 33. (new) The antimicrobial peptide of claim 1, further comprising a carrier selected from the group consisting of a pharmaceutically acceptable carrier, and industrially acceptable carrier, a household product, and a personal care composition.

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Claim 34. (new) The antimicrobial peptide of claim 1, wherein the antimicrobial peptide terminates the growth of the microbe.

Claim 35. (new) The antimicrobial peptide of claim 1, wherein the antimicrobial peptide is administered topically.